Please note this is a condensed catalog.
For a complete version, contact Velan directly.

VELAN FORGED STEEL
GATE, GLOBE & CHECK VALVES

API 602 • ASME CLASSES 150–4500 • 1/4–4" (8–100 mm)

- *Power*
- *Oil & Gas*
- *Petrochemical*
- *Chemical*
- *Marine*
- *Pulp & Paper*
- *Cryogenics*
- *Mining*
- *Construction*

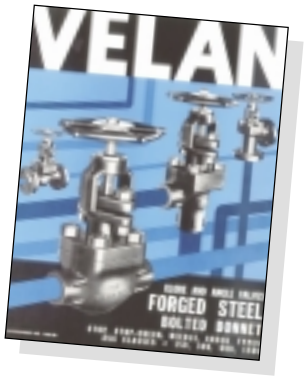
HIGH PERFORMANCE • LOW EMISSIONS

VELAN COMPANY PROFILE

Velan is one of the world's leading manufacturers of industrial valves, supplying forged and cast steel gate, globe, check, ball, butterfly, knife gate and engineered severe service valves for critical applications in power, chemical and petrochemical, oil and gas, pulp and paper, mining, marine, cryogenic and general construction industries.

Founded in 1950, Velan earned a reputation for excellence as a major supplier of forged valves to nuclear power plants and the U.S. Navy. Velan has pioneered many innovative valve designs, emphasizing quality, safety, ease of operation, low emissions, simple in-line maintenance and long cycle life.

Velan's product lines are manufactured in thirteen specialized manufacturing plants, including six in Canada and U.S.A., four in Europe, and three in Asia. We have 1,400 employees, 75% of whom are located in our North American operations.



VELAN FORGED STEEL GATE, GLOBE AND CHECK VALVES have been proven in critical service applications for over 50 years. Today Velan's comprehensive range of API 602 gate, globe, check, angle, and bellows seal valves remain the leading choice for high performance in virtually any industrial application. New in this version, are 45° inclined globe valves, fabricated valves, and expanded information on valves for alkylation service.

CONTENTS

Velan has sales offices and distributors located worldwide.

Visit the Velan website at **www.velan.com** for an updated contact list.

NOTE: *The material in this catalog is for general information. For specific performance data and proper material selection, consult your Velan representative. Although every attempt has been made to ensure that the information contained in this catalog is correct, Velan reserves the right to change designs, materials or specifications without notice.*

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SEMI-AUTOMATIC ASSEMBLY AND TESTING PLANT

FOR CLASS 800 (API 602) GATE VALVES

Please note this is a condensed catalog.
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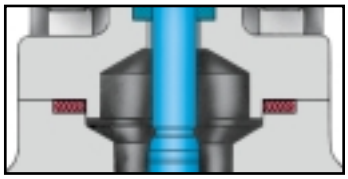
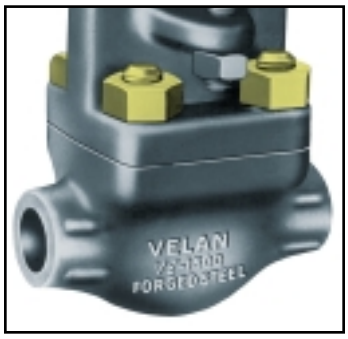
EXCLUSIVE DESIGN FEATURES

STRONGER, LEAKPROOF BODY-BONNET JOINT FULLY ENCASED SPIRAL WOUND GASKET



The design of the gasketed joint is critical. Its compression is better controlled in a fully enclosed cavity. Also, the possibility of unwinding of the SS spiral metal is eliminated.

STRONGER BOLTING ENSURES JOINT TIGHTNESS



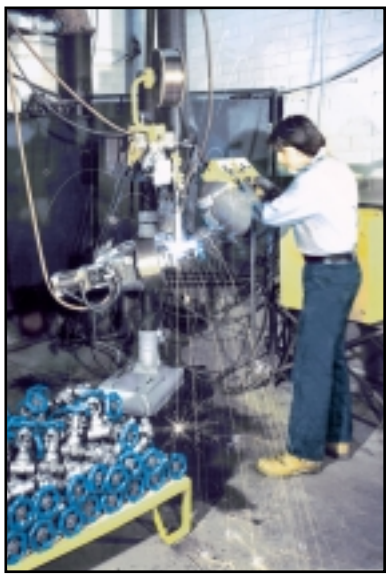
Simple stress vs. deflection tests conducted on spiral wound gaskets in our laboratory confirmed that the control of leakage is highly dependent on gasket seating stress and that the values shown in the **ASME Section III Code**, namely the seating factor **m** = 3 and the seating stress **y** = 10,000 psi used in calculating bolt sizes, are highly insufficient. Our bolted joints are calculated to a minimum gasket stress of 16,000 psi which is essential for a leakproof joint.

GASKET OD	ASME m	VELAN m	ASME y	VELAN y
2 – 5.5"	3	7	10,000	16,000 – 28,000

THREADED-IN STRENGTH WELDED BONNETS (Full-penetration welds on special orders only)

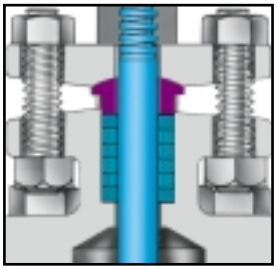
Valves with threaded-in strength welded seats offer an additional level of safety against fugitive emissions.

The body-bonnet welds are made on fully automatic MIG Welders. Weld hardness is controlled (including the heat-affected zone) and maintained below 200 HB.



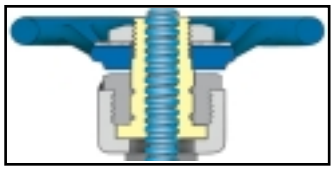
Automatic MIG welder.

SAFER AND TIGHTER STEM SEAL



- Stem hardened and ground.
- Each packing ring individually inserted and compressed for better tightness.
- Two-piece self-aligning gland.
- Sturdy full-length threaded corrosion-resistant bolts provide the required high packing stress.
- Live-loading optional.
- Positive backseat: stem bevel against integral backseat.

TWO-PIECE STEM DRIVE RENEWABLE IN-LINE



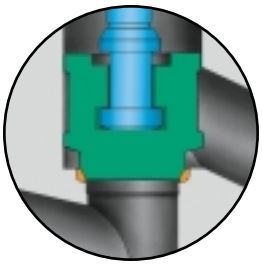
This exclusive and handy feature found only on Velan small forged OS & Y gate valves enables:

- Replacement of stem nut in-line.
- Removal of handwheel without affecting the position of valve (closed or open).
- Better stem nut lubrication control.

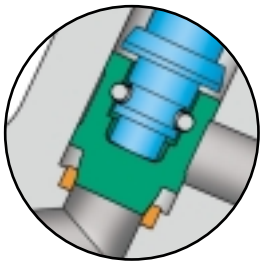
BODY-GUIDED DISC IN GLOBE STOP, NEEDLE AND STOP-CHECK VALVES ELIMINATES SIDE THRUST ON STEM

The top- and bottom-guided disc assures perfect seat and disc alignment in spite of side thrust caused by high velocity flow.

This prevents stem from scoring and galling and provides longer disc seal and body life.



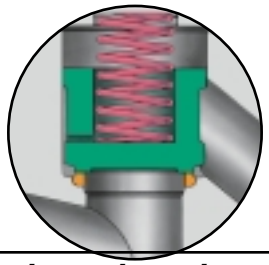
Solid Stellite disc for full Stellite trim



Solid Stellite disc for all Y-pattern valves

BODY-GUIDED DISC IN PISTON-CHECK VALVES

- Assures perfect alignment of disc and seat even at large flow velocities.
- Flat seating faces for low and medium pressures.



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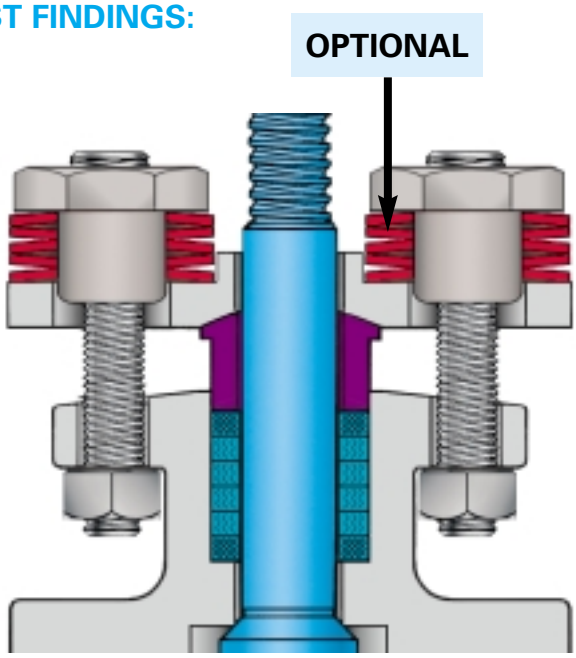
PACKING CHAMBER DESIGN FOR LOW EMISSIONS

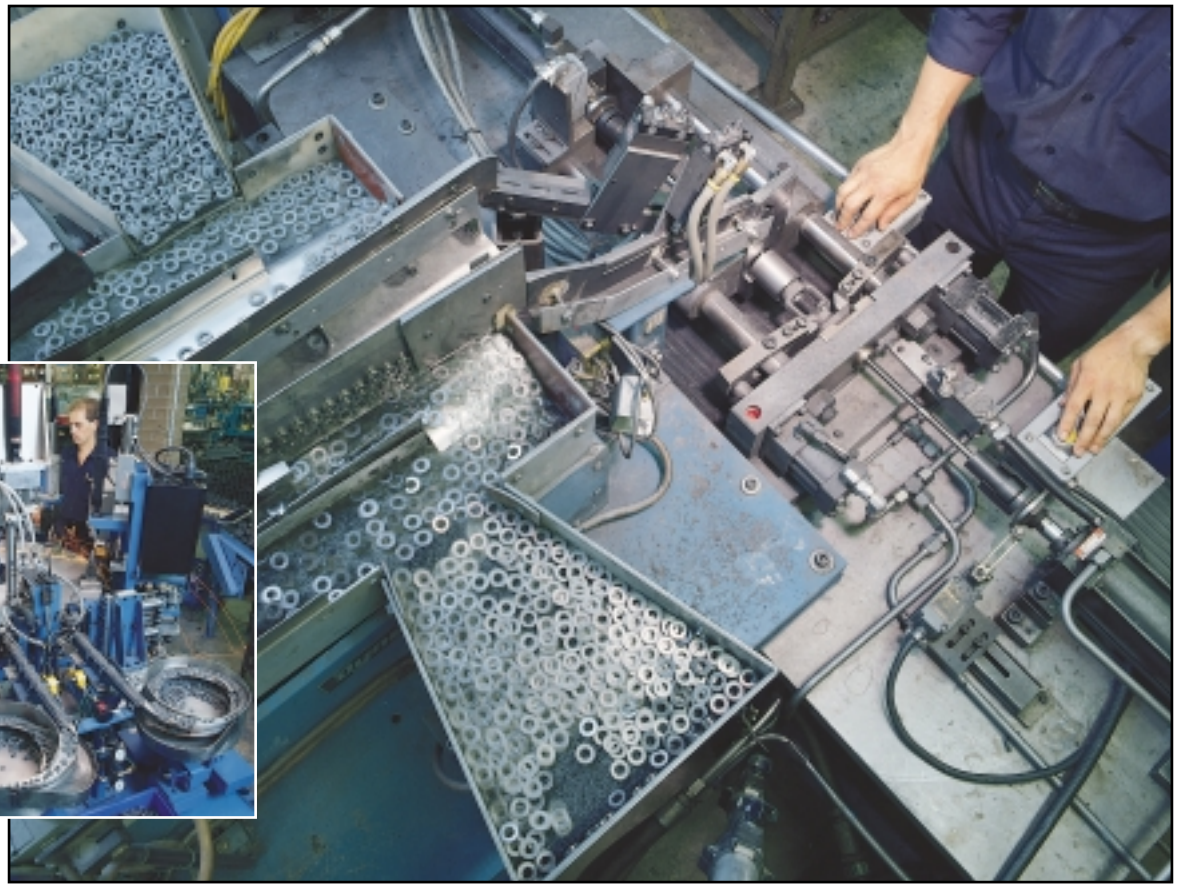
TEST RESULTS LEAD TO DESIGN OF LONG-LIFE LEAKPROOF STEM SEAL

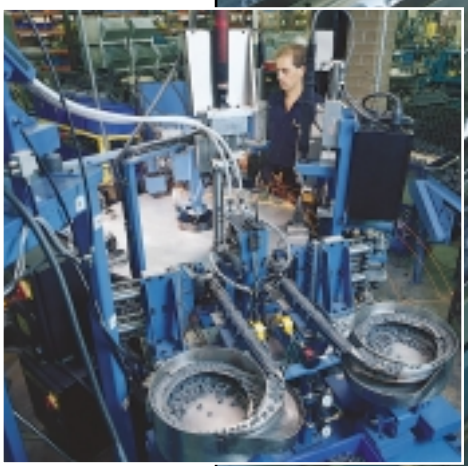
THE VELAN STEM SEAL EVOLVED FROM THESE TEST FINDINGS:



- **Large loads.** Sealing is achieved when compression load is high and packing forms a mass of close fibers of low porosity and permeability (4,000 psi for graphite).
- **Short and narrow packing chambers** improve sealing.
- **Small clearances between vital parts.**
- **Precision stem and packing chambers.** Straightness, roundness and fine finish of stem and packing chamber wall are essential.
- **Short and narrow packing chamber.** Maximum six rings in a single set chamber, and, wherever possible, only 3⁄16–1⁄4" (4.76–6.35 mm) wide.
- **Rings precompressed** to 3500–4000 psi for graphite and to 1800–2000 psi for Teflon to ensure equal stress distribution and effectiveness of all rings.
- **Stem and packing chamber walls.** Close roundness, straightness and superior 8–16 RMS or burnished surface finish.
- **Live-loading (optional).** Two sets of Belleville springs maintain a permanent packing stress of 3500–4000 psi.

Photos to the right and bottom illustrate packing machine and bonnet assembly machine.





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NEW GENERATION OF LOW FUGITIVE EMISSION VALVES

Velan offers standard forged gate, globe, and check valves qualification tested for compliance with EPA fugitive emissions regulations.

PARAMETERS FOR EXCEPTIONAL LOW EMISSION VALVE PERFORMANCE

DESIGN FACTORS FOR GASKET JOINTS

- **Full enclosure** to allow gasket to retain positive radial support during loading.
- **Accurate control** of compression through close tolerances of gasket groove and allowance for radial expansion.
- **No radial machine marks.**
- **Minimum of three inner wraps** to prevent buckling.
- **Minimum of three tack welds.**
- **Minimum of three filler wraps.**
- **Close tolerance** ± 0.005" (0.18 mm) for gasket thickness.
- **Minimum width** up to 5" (127 mm) ID of 0.30" (7.62 mm).
- **Gasket resiliency** tested regularly and inspected at receiving due to sensitivity to variations of quality.

JOINT TIGHTENING

- **All small forged steel valve joints** are tightened with multiple nut runners providing uniform loading and superior zero ppm tightness.

Warning: Gasket is not reusable.

PACKING CHAMBER AND STEM PARAMETERS

- **Stem hardened** and ground to 16 RMS finish.
- **0.001" per inch straightness (0.03 mm per 25.4 mm straightness).**
- **0.003" (0.08 mm) cylindricity.**
- **63 RMS maximum surface finish of packing chamber.**
- **Diametrical clearances:**
  stem-gland, stem-backseat: 0.030–0.040" (0.76–1.02 mm).
  packing chamber-gland: 0.015–0.020" (0.38–0.51 mm).
- **Maximum of six packing rings.**
- **Individual compression:**
  3500–4000 psi for graphite rings.

TYPICAL TEST REPORT

Velan API 602 Class 800 forged steel gate valve.

TEST CONDITIONS

Test Medium:	Methane 500 and 1,000 psig, ambient temperature
Instrument:	Organic vapor analyzer OVA-108, range 1–10,000 ppm, adjusted for 100% methane
Valve Type:	API 602 Class 800 gate valve
Sizes:	½–2" (15–50 mm)
Packing:	Graphite
Gasket:	Spiral wound SS 316 and graphite
Trim:	Wedge: 13 CR Seat: Stellite
Quantity:	15 valves

TEST RESULTS: 15 GATE VALVES ½–2" (15–50 mm)

API 598 test All valves zero leakage

Methane test All valves zero leakage

Cycling test (300 cycles) Gasket: 0 ppm
Packing: 0 ppm

API 598 TESTS FOR 1½" (40 mm) GATE VALVES

CYCLES	PART TESTED	LEAKAGE (ppm)
1000	gasket	0
	packing	0

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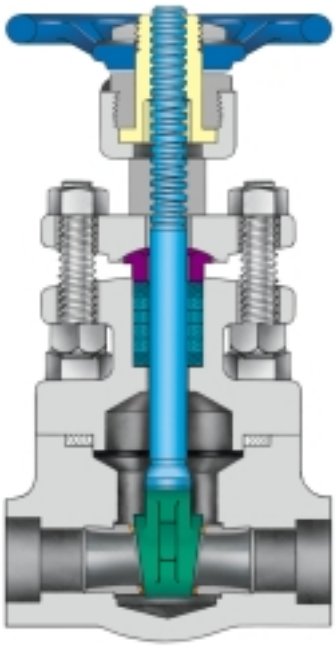
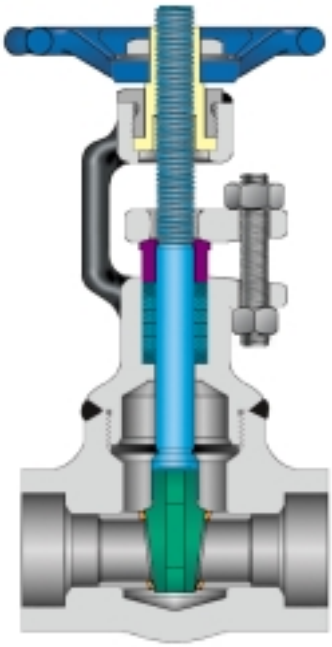
FORGED STEEL GATE VALVES, ¼–2" (8–50 mm)

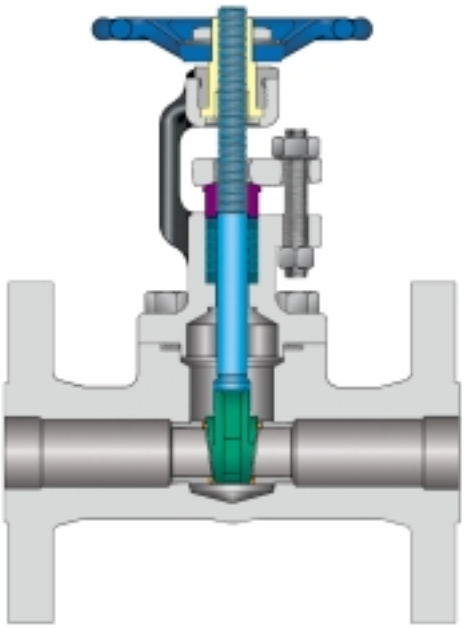
THREADED, SOCKET WELD & FLANGED
ASME CLASS 800: 1975 psi @ 100°F
ASME CLASS 1500: 3705 psi @ 100°F
FLANGED ASME CLASSES 150, 300, 600, 1500



BOLTED BONNET
2054B – Class 800
3054B – Class 1500



WELDED BONNET
2054W – Class 800
3054W – Class 1500



FLANGED BOLTED BONNET
0054B – Class 150
1054B – Class 300
2054B – Class 600
3054B – Class 1500

DESIGN FEATURES

- A compact but extremely sturdy design for high pressure-temperature service.
- Solid Stellite 6 wedge (optional) ensures low friction and long service life.
- For Class 1500 valves and for steam service, seats are seal-welded to the body.
- Packing rings are precompressed to 4000 psi to provide a high integrity seal.
- For welded bonnet valves, the bonnet is threaded in and torqued to an engineered torque value and the body bonnet joint is strength-welded, offering double protection against leakage. (Body/bonnet threads and strength-weld).
- Fully guided wedge reduces wear on seating surfaces.
- Repairable 2-piece stem drive.

OPTIONAL FEATURES (SPECIAL APPLICATIONS)

- A special design is also available with double packing, leak-off connection, live-loading and a packing blowout for easy removal of old packing.
- Bolted Bonnet Gate Valves for Alkylation service (HF Acid service see page 19).
- Parallel Slide Gate Valves.
- API 603 ½–1½" (15–40 mm), for ASME Classes 150, 300 & 600.

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BOLTED BONNET GATE DIMENSIONS

Size in mm	A Port		B End to End		C Center to Top Closed		D Center to Top Open		H Handwheel		K Socket Weld Bore	L Socket Weld Depth
	800	1500	800	1500	800	1500	800	1500	800	1500		
1/4 8	0.25 6	0.25 6	2.88 73	4.00 102	4.69 119	7.13 181	5.19 132	7.75 197	2.50 64	3.50 89	0.555 14.10	0.38 9.7
3/8 10	0.25 6	0.35 9	2.88 73	4.00 102	4.69 119	7.13 181	5.19 132	7.75 197	2.50 64	3.50 89	0.690 17.53	0.38 10
1/2 15	0.38 10	0.50 13	2.88 73	4.00 102	4.69 119	7.13 181	5.19 132	7.75 197	2.50 64	3.50 89	0.855 21.72	0.38 10
3/4 20	0.50 13		3.25 83	5.00 127	5.91 150	7.25 184	6.75 171	7.88 200	3.50 89	3.50 89	1.065 27.05	0.50 13
1 25	0.69 18		3.50 89	6.00 152	6.38 162	8.70 221	7.38 188	9.63 244	3.50 89	5.00 127	1.330 33.78	0.50 13
1 1/4 32	1.25 32		5.00 127	7.00 178	7.77 197	9.12 232	9.12 232	10.63 270	5.00 127	6.00 152	1.675 42.55	0.50 13
1 1/2 40	1.25 32		5.00 127	7.00 178	7.77 197	9.12 232	9.12 232	10.63 270	5.00 127	6.00 152	1.915 48.64	0.50 13
2 50	1.50 38		5.25 133	9.00 229	8.70 221	10.56 268	10.40 264	12.30 312	6.00 152	10.00 254	2.406 61.11	0.63 16

FLANGED FACE-TO-FACE

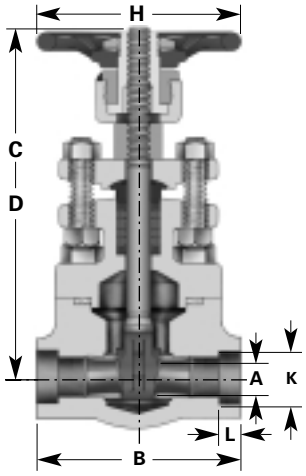
Size in mm	Flanged face-to-face				
	150	300	600	1500	2500
1/4 8	4.00 102	5.50 139	6.50 165	8.50 216	–
3/8 10	4.00 102	5.50 139	6.50 165	8.50 216	–
1/2 15	4.25 108	5.50 139	6.50 165	8.50 216	10.38 264
3/4 20	4.62 117	6.00 152	7.50 191	9.00 229	10.75 273
1 25	5.00 127	6.50 165	8.50 216	10.00 254	12.12 308
1 1/4 32	5.50 140	7.00 178	9.00 229	11.00 279	13.75 349
1 1/2 40	6.50 165	7.50 191	9.50 241	12.00 305	15.12 384
2 50	7.00 178	8.50 216	11.50 292	14.50 368	17.75 451

Bolted bonnet available with live-loading, double packing and leak-off or bellows seal for emission-free service.

BOLTED BONNET GATE FULL PORT DIMENSIONS

Size in mm	A Port	B End to End		C Center to Top Closed		D Center to Top Open		H Handwheel		K Socket Weld Bore	L Socket Weld Depth
		800	1500	800	1500	800	1500	800	1500		
1/4 8	0.25 6	–	4.00 102	–	7.10 180	–	7.8 198	–	3.50 89	0.555 14.10	0.38 10
3/8 10	0.35 9	–	4.00 102	–	7.10 180	–	7.8 198	–	3.50 89	0.690 17.53	0.38 10
1/2 15	0.50 13	3.25 83	4.00 102	5.90 150	8.7 221	6.63 168	7.88 200	3.50 89	3.50 89	0.855 21.72	0.38 10
3/4 20	0.69 18	3.50 89	6.00 152	6.40 162	9.10 231	7.40 188	9.60 244	5.00 127	5.00 127	1.065 27.05	0.50 13
1 25	0.96 24	5.00 127	7.00 178	7.80 198	9.10 231	9.10 231	10.60 269	6.00 152	6.00 152	1.330 33.78	0.50 13
1 1/4 32	1.25 32	5.00 127	7.00 178	7.80 198	9.10 231	9.10 231	10.60 269	6.00 152	6.00 152	1.675 42.55	0.50 13
1 1/2 40	1.50 38	5.25 133	9.00 229	8.60 218	10.60 269	10.40 264	12.30 312	6.00 152	10.00 254	1.915 48.64	0.50 13
2 50	2.00(1) 51	6.00 152	9.00 229	10.90 277	11.50 292	13.12 333	13.75 349	8.00 203	10.00 254	2.406 61.11	0.62 16

(1) 1.89" (48 mm) Class 1500



WELDED BONNET GATE VALVE DIMENSIONS

Size in mm	A Port				B End to End				C Center to Top Closed				D Center to Top Open				H Handwheel				K Socket Weld Bore	L Socket Weld Depth
	800	1500	2500	4500	800	1500	2500	4500	800	1500	2500	4500	800	1500	2500	4500	800	1500	2500	4500		
1/4 8	0.25 6	0.25 6	–	–	2.88 73	3.50 89	–	–	4.63 117	6.40 163	–	–	5.13 130	7.10 180	–	–	2.50 64	3.50 89	–	–	0.555 14.10	0.38 10
3/8 10	0.25 6	0.25 6	–	–	2.88 73	3.50 89	–	–	4.63 117	6.40 163	–	–	5.13 130	7.10 180	–	–	2.50 64	3.50 89	–	–	0.690 17.53	0.38 10
1/2 15	0.38 10	0.35 9	0.50 13	–	2.88 73	3.50 89	5.00 127	–	4.63 117	6.40 163	9.00 229	–	5.13 130	7.10 180	9.80 249	–	2.50 64	3.50 89	6.00 152	–	0.855 21.72	0.38 10
3/4 20	0.50 13	0.50 13	0.50 13	0.58 15	3.25 83	3.50 89	5.00 127	7.00 178	5.90 150	6.40 163	9.00 229	11.82 300	6.63 168	7.10 180	9.80 249	12.62 321	3.50 89	3.50 89	6.00 152	8.00 203	1.065 27.05	0.50 13
1 25	0.69 18	0.69 18	0.69 18	0.58 15	3.50 89	5.00 127	5.00 127	8.00 203	6.30 160	8.10 206	9.10 231	11.82 300	7.20 182	8.90 226	10.00 254	12.62 321	3.50 89	5.00 127	6.00 152	8.00 203	1.330 33.78	0.50 13
1 1/4 32	1.25 32	1.25 32	0.96 24	0.88 22	5.00 127	5.25 133	10.00 254	11.00 279	7.77 197	9.40 239	11.30 287	16.50 419	9.12 231	10.80 274	12.50 318	17.72 450	5.00 127	6.00 152	8.00 203	12.00 305	1.675 42.55	0.50 13
1 1/2 40	1.25 32	1.25 32	0.96 24	0.88 22	5.00 127	5.25 133	10.00 254	11.00 279	7.77 197	9.40 239	11.30 287	16.50 419	9.12 231	10.80 274	12.50 318	17.72 450	5.00 127	6.00 152	8.00 203	12.00 305	1.915 48.64	0.50 13
2 50	1.50 38	1.50 38	1.50 38	1.20 31	5.25 133	10.00 254	10.00 254	11.00 279	8.50 216	12.40 315	12.40 315	17.00 432	10.40 264	14.10 358	14.15 358	18.6 472	6.00 152	10.00 254	10.00 254	12.00 305	2.406 61.11	0.62 16

(2) Full bore also available for Classes 800 & 1500

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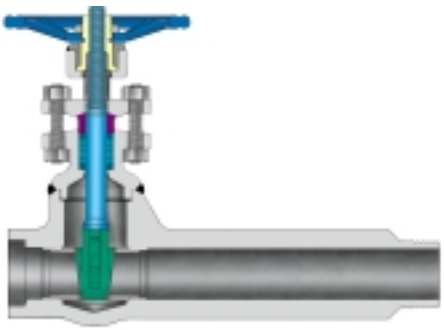
FORGED STEEL EXTENDED BODY GATE VALVES CONVENTIONAL PORT, ½– 2" (15–50 mm)

THREADED OR SOCKET WELD FEMALE
API 602, ASME CLASSES 800, 1500

INTEGRALLY-REINFORCED EXTENDED BODY – 2174W



EXTENDED BODY – 2184W

TWO TYPES

- This valve is available with an extended body or an integrally-reinforced extended body (IREB).
- Extended body gate valves have a welded or threaded connection and are used for tapping of pressure vessels and header lines for vents, drains or takeoff lines and instrumentation.
- Also available: extended body assemblies for vents, drains, and instrument root valves.

AVAILABLE VARIATIONS[2]

FEMALE STANDARD END	MALE EXTENDED END	
	Standard: 2184W, 3184W	IREB: 2174W, 3174W
Thread	Couplet, Thread or Socket	Couplet or Socket
Socket Weld	Couplet or Socket	

EXTENDED BODY GATE VALVE DIMENSIONS

Size in / mm	A Port	B End to End		C Center to Top Closed		D Center to Top Open		H Handwheel		K Socket Weld Bore	DA Short End to Center		DB Long End to Center	
	800 - 1500	800	1500	800	1500	800	1500	800	1500	800 - 1500	800	1500	800	1500
½ / 15	0.50[1] / 13	5.63 / 143	5.75 / 146	5.90 / 150	6.2 / 158	6.6 / 168	6.8 / 173	3.5 / 89	3.5 / 89	0.855 / 21.72	1.63 / 41	1.75 / 44	4.00 / 102	4.00 / 102
¾ / 20	0.50 / 13	5.63 / 143	5.75 / 146	5.90 / 150	6.2 / 158	6.6 / 168	6.8 / 173	3.5 / 89	3.5 / 89	1.065 / 27.05	1.63 / 41	1.75 / 44	4.00 / 102	4.00 / 102
1 / 25	0.69 / 18	5.75 / 146	7.25 / 184	6.4 / 163	8.1 / 206	7.4 / 188	8.9 / 226	3.5 / 89	5.0 / 127	1.330 / 33.78	1.75 / 44	2.50 / 64	4.00 / 102	4.75 / 121
1¼ / 32	1.25 / 32	7.00 / 178	–	7.6 / 193	–	9.2 / 234	–	5.0 / 127	–	1.675 / 42.55	2.25 / 57	–	4.75 / 121	–
1½ / 40	1.25 / 32	7.25 / 184	7.88 / 200	7.6 / 193	9.40 / 239	9.2 / 234	10.80 / 274	5.0 / 127	6.00 / 152	1.915 / 48.64	2.50 / 64	2.63 / 67	4.75 / 121	5.25 / 133
2 / 50	1.50 / 38	7.88 / 200	12.25 / 311	8.50 / 216	12.40 / 315	10.40 / 264	14.10 / 358	6.00 / 152	10.00 / 254	2.406 / 61.11	2.63 / 67	5.00 / 127	5.25 / 133	7.25 / 184

IREB GATE VALVE DIMENSIONS

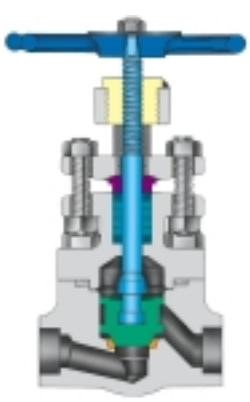
Size in / mm	A Port	B End to End		C Center to Top Closed		D Center to Top Open		H Handwheel		K Socket Weld Bore	L Socket Weld Depth	DA Short End to Center		DB Long End to Center	
	800 - 1500	800	1500	800	1500	800	1500	800	1500	800 - 1500	800 - 1500	800	1500	800	1500
½ / 15	0.50[1] / 13	8.63 / 219	8.88 / 226	5.90 / 150	6.2 / 158	6.63 / 168	6.8 / 173	3.50 / 89	3.50 / 89	0.855 / 21.72	0.38 / 10	1.63 / 41	1.75 / 44	7.00 / 178	7.13 / 181
¾ / 20	0.50 / 13	8.63 / 219	8.88 / 226	5.90 / 150	6.2 / 158	6.63 / 168	6.8 / 173	3.50 / 89	3.50 / 89	1.065 / 27.05	0.50 / 13	1.63 / 41	1.75 / 44	7.00 / 178	7.13 / 181
1 / 25	0.69 / 18	9.38 / 238	10.13 / 257	6.4 / 163	8.1 / 206	7.4 / 188	8.9 / 226	3.50 / 89	5.00 / 127	1.330 / 33.78	0.50 / 13	1.75 / 44	2.50 / 64	7.63 / 194	7.63 / 194
1¼ / 32	1.25 / 32	10.50 / 266	10.63 / 270	7.6 / 193	9.4 / 239	9.2 / 234	10.8 / 274	5.0 / 127	6.00 / 152	1.675 / 42.55	0.50 / 13	2.50 / 64	2.63 / 67	8.00 / 203	8.00 / 203
1½ / 40	1.25 / 32	10.50 / 266	10.63 / 270	7.6 / 193	9.4 / 239	9.2 / 234	10.8 / 274	5.0 / 127	6.00 / 152	1.915 / 48.64	0.50 / 13	2.50 / 64	2.63 / 67	8.00 / 203	8.00 / 203
2 / 50	1.50 / 38	11.88 / 302	14.25 / 362	8.50 / 216	12.4 / 315	10.4 / 264	14.1 / 358	6.00 / 152	10.00 / 254	2.406 / 61.11	0.62 / 16	2.63 / 67	5.00 / 127	9.25 / 235	9.25 / 235

(1) 0.36" (9 mm) seat for ½" NPT male end only. *(2) Bolted bonnet also available.*

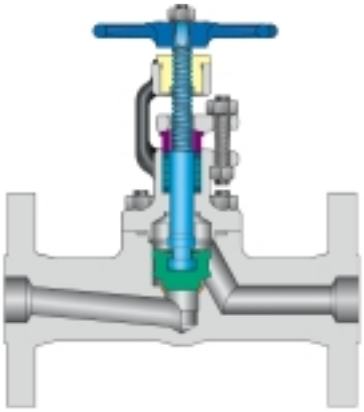
Please note this is a condensed catalog. For a complete version, contact Velan directly.

FORGED STEEL GLOBE VALVES
CONVENTIONAL PORT, ¼–2" (8–50 mm)

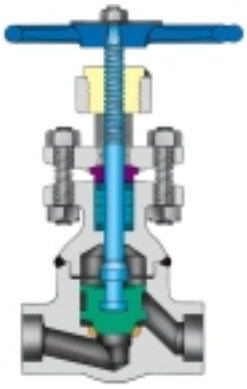
THREADED OR SOCKET WELD
ASME CLASS 800: 1975 psi @ 100°F
ASME CLASS 1500: 3705 psi @ 100°F
FLANGED ASME CLASSES 150, 300, 600, 1500



BOLTED BONNET
2074B – Class 800
3074B – Class 1500



FLANGED BOLTED BONNET
0074B – Class 150 2074B – Class 600
1074B – Class 300 3074B – Class 1500



WELDED BONNET
2074W – Class 800
3074W – Class 1500

Available with live-loading, double packing and leak-off or bellows seal for emission-free service.

BOLTED BONNET GLOBE DIMENSIONS

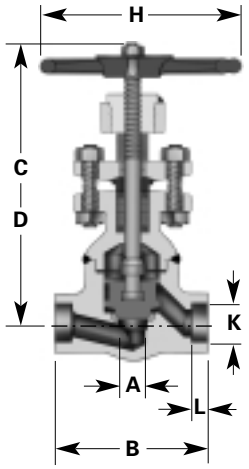
Size in mm	A Port		B End to End		C Center to Top Closed		D Center to Top Open		H Handwheel		K Socket Weld Bore	L Socket Weld Depth	Flanged Face to Face			
	800	1500	800	1500	800	1500	800	1500	800	1500			150	300	600	1500
1/4 8	0.31 8	0.50 13	2.88 73	4.00 102	4.5 114	7.69 195	4.8 122	8.1 206	2.5 64	6 152	0.555 14.10	0.38 10	4.00 102	6.00 152	6.50 165	8.50 216
3/8 10	0.31 8	0.50 13	2.88 73	4.00 102	4.5 114	7.69 195	4.8 122	8.1 206	2.5 64	6 152	0.690 17.53	0.38 10	4.00 102	6.00 152	6.50 165	8.50 216
1/2 15	0.31 8	0.50 13	2.88 73	4.00 102	4.5 114	7.69 195	4.8 122	8.1 206	2.5 64	6 152	0.855 21.72	0.38 10	4.25 108	6.00 152	6.50 165	8.50 216
3/4 20	0.50 13	0.50 13	3.25 83	5.00 127	6.6 168	7.8 198	7.1 180	8.4 213	4.0 102	6 152	1.065 27.05	0.50 13	4.62 117	7.00 178	7.50 190	9.00 229
1 25	0.75 19	0.75 19	3.50 89	6.00 152	6.7 170	9.2 233	7.3 185	10.0 254	4.0 102	8 203	1.330 33.78	0.50 13	5.00 127	8.00 203	8.50 215	10.00 254
1 1/4 32	1.25 32	1.25 32	5.00 127	7.00 178	8.1 206	10.1 257	8.7 221	11.0 279	6.0 152	8 203	1.675 42.55	0.50 13	5.50 140	8.50 216	9.00 229	11.00 279
1 1/2 40	1.25 32	1.25 32	5.00 127	7.00 178	8.1 206	10.1 257	8.7 221	11.0 279	6.0 152	8 203	1.915 48.64	0.50 13	6.50 165	9.00 229	9.50 241	12.00 305
2 50	1.50 38	1.50 38	8.00 203	9.00 229	10.4 264	11.0 279	11.2 285	12.3 312	8.0 203	12 305	2.406 61.11	0.63 16	8.00 203	10.50 266	11.50 292	14.50 368

AVAILABLE FEATURES

	Bolted Bonnet		Welded Bonnet	
Class	800	1500	800	1500
Stop	2074B	3074B	2074W	3074W
Stop check	2084B	3084B	2084W	3084W
Needle	2094B	3094B	2094W	3094W
Flow control	2014B	3014B	2014W	3014W

WELDED BONNET GLOBE DIMENSIONS

Size in mm	A Port		B End to End		C Center to Top Closed		D Center to Top Open		H Handwheel		K Socket Weld Bore	L Socket Weld Depth
	800	1500	800	1500	800	1500	800	1500	800	1500		
1/4 8	0.31 8	0.50 13	2.88 73	3.50 89	4.57 116	6.8 173	4.84 123	7.3 185	2.5 64	6.0 152	0.555 14.10	0.38 10
3/8 10	0.31 8	0.50 13	2.88 73	3.50 89	4.57 116	6.8 173	4.84 123	7.3 185	2.5 64	6.0 152	0.690 17.53	0.38 10
1/2 15	0.31 8	0.50 13	2.88 73	3.50 89	4.57 116	6.8 173	4.84 123	7.3 185	2.5 64	6.0 152	0.855 21.72	0.38 10
3/4 20	0.50 13	0.50 13	3.25 83	3.50 89	6.60 168	6.8 173	6.90 175	7.3 185	4.0 102	6.0 152	1.065 27.05	0.50 13
1 25	0.75 19	0.75 19	3.50 89	5.00 127	6.70 170	8.21 209	7.20 183	8.84 225	4.0 102	6.0 152	1.330 33.78	0.50 13
1 1/4 32	1.25 32	1.25 32	5.00 127	5.25 133	8.05 204	10.06 256	8.93 227	10.76 273	6.0 152	8.0 203	1.675 42.55	0.50 13
1 1/2 40	1.25 32	1.25 32	5.00 127	5.25 133	8.05 204	10.06 256	8.93 227	10.76 273	6.0 152	8.0 203	1.915 48.64	0.50 13
2 50	1.38 35	1.50 38	5.25 133	10.00 254	9.30 236	12.6 320	10.00 254	14.00 356	6.0 152	12.0 305	2.406 61.11	0.63 16

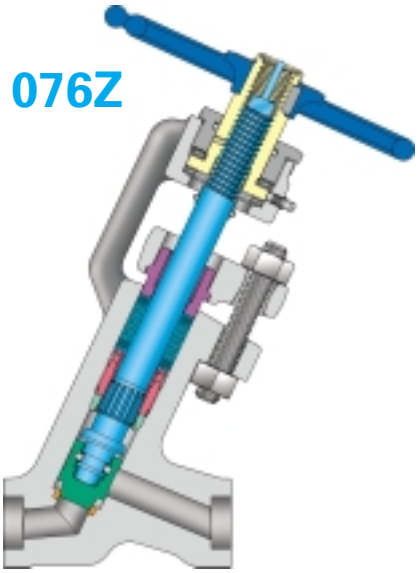


For Y-Pattern globe valves, see page 10.

Please note this is a condensed catalog. For a complete version, contact Velan directly.

FORGED STEEL Y-PATTERN BONNETLESS GLOBE VALVES, ½–4" (15–100 mm)

CONVENTIONAL PORT OPENING, THREADED, SOCKET WELD OR BUTT WELD
ASME CLASSES 1690, 2680, 4500



NON-ROTATING STEM
Patented for quick serviceability, (USA patent number 4356832).

DESIGN FEATURES

- Designed for quick and easy maintenance – one step removal of all working parts including packing.
- All pressure containing parts within one body-bonnet forging – no joints to leak or welds to cut for servicing.
- Non rotating stem allows a non-spinning disc, ensures low torque and prevents torsional damage of the packing.
- Fully enclosed, lubricated stem drive system with needle bearings ensures low operating torque.
- Solid Stellite disc, seat ring and backseat provide excellent long service life even in severe services.
- Backseat bevel on the stem, not on the disc, satisfies both API-600 and API-602 specifications.

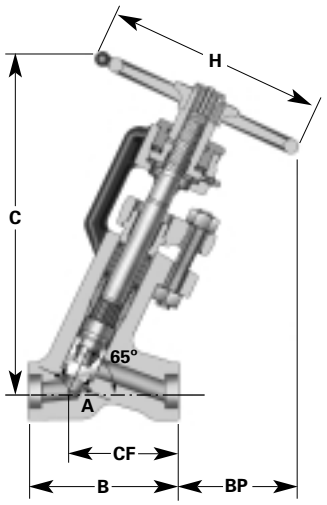
NOTE: *For more information consult Velan's Y-Pattern Globe Valves catalogue VEL-BG.*

FIGURE NUMBERS

THREADED, SOCKET WELD OR BUTT WELD CONNECTIONS			
CLASS	**STOP VALVE**	**STOP CHECK VALVE**	**NEEDLE VALVE**
1690	8076Z	8086Z	8096Z
2680	9076Z	9086Z	9096Z
4500	5076Z	5086Z	5096Z

DIMENSIONS

Size in mm	A Port		B End to End		C Center to Top		H Handwheel		BP Clearance Open		CF Center to End	
	1690 2680	4500	1690 2680	4500	1690 2680	4500	1690 2680	4500	1690 2680	4500	1690 2680	4500
1/2 15	0.559 14.2	0.375 9.5	4.88 124	5.75 146	9.63 245	11.75 298	6.00 152	6.00 152	3.63 92	3.25 83	3.20 81	4.19 106
3/4 20	0.559 14.2	0.559 14.2	4.88 124	7.00 178	9.63 245	14.20 361	6.00 152	8.00 203	3.63 92	6.00 152	3.20 81	3.88 99
1 25	0.833 21.2	0.559 14.2	5.75 146	7.00 178	13.19 335	14.20 361	8.00 203	8.00 203	5.13 130	6.00 152	4.19 106	3.88 99
1 1/4 32	1.125 28.6	0.833 21.2	7.25 184	10.13 257	16.63 422	18.88 480	12.00 305	12.00 305	7.57 192	7.00 178	4.94 125	6.57 167
1 1/2 40	1.125 28.6	1.125 28.6	7.25 184	12.00 305	16.63 422	20.75 527	12.00 305	18.00 457	7.57 192	8.00 203	4.94 125	8.00 203
2 50	1.688 42.9	1.125 28.6	10.13 257	12.00 305	19.88 505	20.75 527	12.00 305	18.00 457	7.50 190	8.00 203	6.57 167	8.00 203
2 1/2 (1) 65	1.688 42.9	1.50 38.1	12.00 305	12.00 305	20.69 526	20.75 527	16.00 (2) 406	16.00 (2) 406	7.25 184	7.25 184	8.00 203	8.00 203
3 (1) 80	1.688 42.9	1.50 38.1	12.00 305	12.00 305	20.69 526	20.75 527	16.00 (2) 406	16.00 (2) 406	7.25 184	7.25 184	8.00 203	8.00 203
4 100	1.688 42.9	1.50 38.1	12.00 305	12.00 305	20.69 526	20.75 527	16.00 (2) 406	16.00 (2) 406	7.25 184	7.25 184	8.00 203	8.00 203

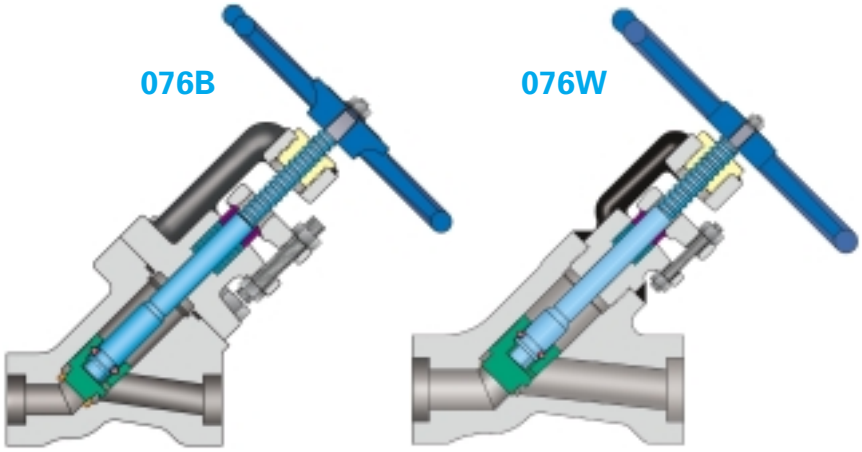


(1) For Classes 1690 & 2680, dimensions are as shown, or same as for 2" (50 mm) valve, depending on end connection.
(2) Impactor handle.
(3) For butt weld ends, weights is 110 lb (50 kg).

Please note this is a condensed catalog. For a complete version, contact Velan directly.

FORGED STEEL 45° INCLINED GLOBE VALVES, ½–2" (15–50 mm)

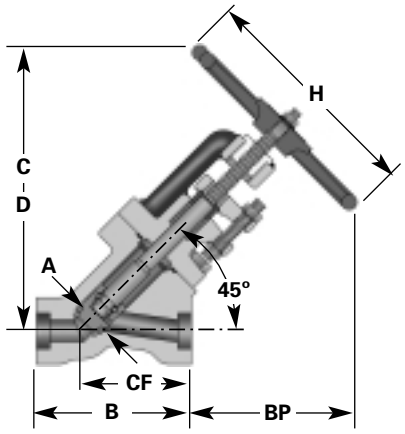
CONVENTIONAL PORT OPENING, THREADED, SOCKET WELD OR BUTT WELD
ASME CLASSES 800, 1690, 2680



45° BOLTED BONNET **45° WELDED BONNET**

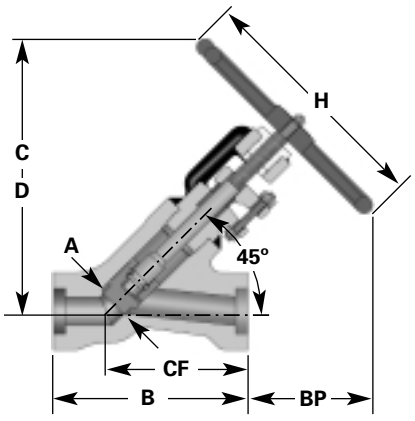
BOLTED BONNET GLOBE 45° INCLINED VALVE DIMENSIONS

Size	A	B		C		D		H		BP		CF	
	Port	End to End		Center to Top Closed		Center to Top Open		Handwheel		Clearance Open		Center to End	
in mm	800 1690	800	1690	800	1690	800	1690	800	1690	800	1690	800	1690
1/2 15	0.559 14.2	4.00 102	4.88 124	6.76 1.72	8.81 224	7.20 183	9.25 235	4.00 102	6.00 152	4.22 107	5.50 140	2.88 73	3.50 99
3/4 20	0.559 14.2	4.00 102	4.88 124	6.76 1.72	8.81 224	7.20 183	9.25 235	4.00 102	6.00 152	4.22 107	5.50 140	2.88 73	3.50 99
1 25	0.833 21.2	4.88 124	5.75 146	7.16 182	10.60 269	7.78 198	11.22 285	4.00 102	8.00 203	4.17 106	6.75 172	3.50 89	4.19 106
1 1/4 32	1.125 28.6	5.75 146	7.25 184	9.05 230	11.72 298	9.85 250	12.51 318	6.00 152	8.00 203	5.40 137	6.73 171	4.19 106	5.50 140
1 1/2 40	1.125 28.6	5.75 146	7.25 184	9.05 230	11.72 298	9.85 250	12.51 318	6.00 152	8.00 203	5.40 137	6.73 171	4.19 106	5.50 140
2 50	1.50 38.1	7.25 184	10.13 275	11.72 298	14.32 364	12.78 325	15.38 391	8.00 203	12.00 305	7.00 172	7.58 193	5.50 140	7.38 187



WELDED BONNET GLOBE 45° INCLINED VALVE DIMENSIONS

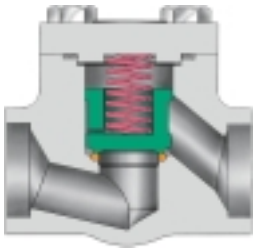
Size	A	B	C	D	H	BP	CF
	Port	End to End	Center to Top Closed	Center to Top Open	Handwheel	Clearance Open	Center to End
in mm	1690 & 2680	1690 & 2680	1690 & 2680	1690 & 2680	1690 & 2680	1690 & 2680	1690 & 2680
1/2 15	0.559 14.2	4.88 124	7.75 197	8.19 208	6.00 152	4.00 102	3.50 99
3/4 20	0.559 14.2	4.88 124	7.75 197	8.19 208	6.00 152	4.00 102	3.50 99
1 25	0.833 21.2	5.75 146	9.73 247	10.38 264	8.00 203	5.19 132	4.19 106
1 1/4 32	1.125 28.6	7.25 184	11.37 28	12.22 310	8.00 203	6.38 162	5.50 140
1 1/2 40	1.125 28.6	7.25 184	11.37 28	12.22 310	8.00 203	6.38 162	5.50 140
2 50	1.50 38.1	10.13 275	14.19 360	15.26 388	12.00 305	7.45 189	7.38 187



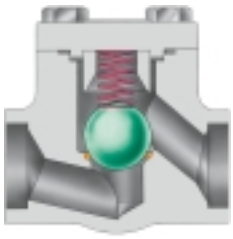
Please note this is a condensed catalog.
For a complete version, contact Velan directly.

FORGED STEEL CHECK VALVES
CONVENTIONAL PORT OPENING, ¼–2" (8–50 mm)

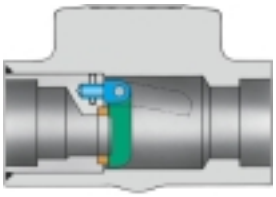
PISTON, BALL OR SWING TYPE ASME CLASSES 800, 1500
THREADED OR SOCKET WELD FLANGED
ASME CLASSES 150, 300, 600, 1500



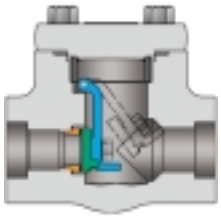
PISTON BOLTED COVER



BALL TYPE BOLTED COVER



COVERLESS SWING CHECK



SWING CHECK BOLTED COVER

SPECIFICATIONS

TYPE	BOLTED COVER	COVER-LESS
Piston check	034B	—
Ball check	024B	—
Swing check	114B	114W

(1) Ball type only
(2) Swing type only
(3) Bolted bonnet only
(4) Piston or swing type only
(5) Piston or ball type only
(6) Bolted bonnet swing check disc Stellite 6 only.

BOLTED COVER PISTON, BALL AND SWING CHECK DIMENSIONS

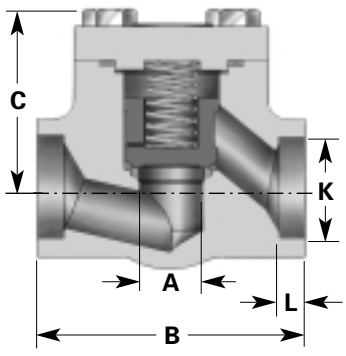
Size in mm	A Port				B End to End				C Center to Top Bolts				K Socket Weld	L Socket Weld	Flanged Face to Face			
	Piston & Ball		Swing Check		Piston & Ball		Swing Check		Piston & Ball		Swing Check		Piston, Ball & Swing Check		Piston, Ball & Swing Check			
	800	1500	800	1500	800	1500	800	1500	800	1500	800	1500	Bore	Depth	150	300	600	1500
1/4 8	0.31 7.8	0.50 12.7	–	–	2.88 73	4.00 102	–	–	1.90 48	2.70 68	–	–	0.555 14.10	0.38 10	4.00 102	–	–	–
3/8 10	0.31 7.8	0.50 12.7	–	–	2.88 73	4.00 102	–	–	1.90 48	2.70 68	–	–	0.690 17.53	0.38 10	4.00 102	–	–	–
1/2 15	0.31 7.8	0.50 12.7	0.50 12.7	0.50 12.7	2.88 73	4.00 102	3.50 89	6.00 152	1.90 48	2.70 68	2.50 64	3.70 94	0.855 21.72	0.38 10	4.25 108	6.00 152	6.50 165	8.50 216
3/4 20	0.50 12.7	0.50 12.7	0.50 12.7	0.50 12.7	3.25 83	5.00 127	3.50 89	6.00 152	2.30 58	2.90 74	2.50 64	3.70 94	1.065 27.05	0.50 13	4.62 117	7.00 178	7.50 191	9.00 229
1 25	0.75 19.1	0.75 19.1	0.75 19.1	0.75 19.1	3.50 89	6.00 152	5.00 127	6.00 152	2.60 66	3.50 89	3.50 89	3.70 94	1.330 33.78	0.50 13	5.00 127	8.50 216	8.50 216	10.00 254
1 1/4 32	1.25 31.8	1.25 31.8	1.25 31.8	1.25 31.8	5.00 127	7.00 178	5.25 133	7.00 178	3.70 94	4.20 107	3.40 86	3.70 94	1.675 42.55	0.50 13	5.50 140	9.00 229	9.00 229	11.00 279
1 1/2 40	1.25 31.8	1.25 31.8	1.25 31.8	1.25 31.8	5.00 127	7.00 178	5.25 133	7.00 178	3.70 94	4.20 107	3.40 86	4.20 107	1.915 48.64	0.50 13	6.50 165	9.50 241	9.50 241	12.00 305
2 50	1.50 38.1	1.50 38.1	1.50 38.1	1.50 38.1	8.00 203	9.00 229	6.00 152	9.00 229	4.80 122	5.40 137	4.30 109	5.20 132	2.406 61.11	0.63 16	8.00 203	10.50 267	11.50 292	14.50 368

(1) For swing check valves Classes 300, 600 and 1500 face-to-face dimensions are the same as for piston and ball check valves, for Class 150 swing check valves contact the factory.

CLASS 800 1975 psi @ 100°F
CLASS 1500 3705 psi @ 100°F

COVERLESS SWING CHECK DIMENSIONS (CLASS 800)

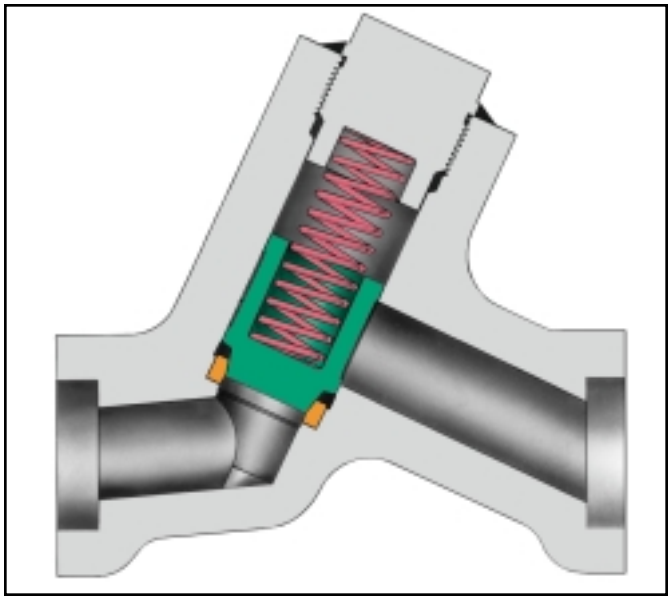
Size in mm	A Port	B End to End	C Center to Top of Body	K Socket Weld Bore	L Socket Weld
1/4 8	0.50 13	3.25 83	1.40 36	0.555 14.10	0.38 10
3/8 10	0.50 13	3.25 83	1.40 36	0.690 17.53	0.38 10
1/2 15	0.50 13	3.25 83	1.40 36	0.855 21.72	0.38 10
3/4 20	0.50 13	3.25 83	1.40 36	1.065 27.05	0.50 13
1 25	0.75 19	3.50 89	1.70 43	1.330 33.78	0.50 13
1 1/4 32	1.25 32	5.00 127	2.50 64	1.675 42.55	0.50 13
1 1/2 40	1.25 32	5.00 127	2.50 64	1.915 48.64	0.50 13
2 50	1.50 38	5.25 133	2.30 58	2.406 61.11	0.63 16

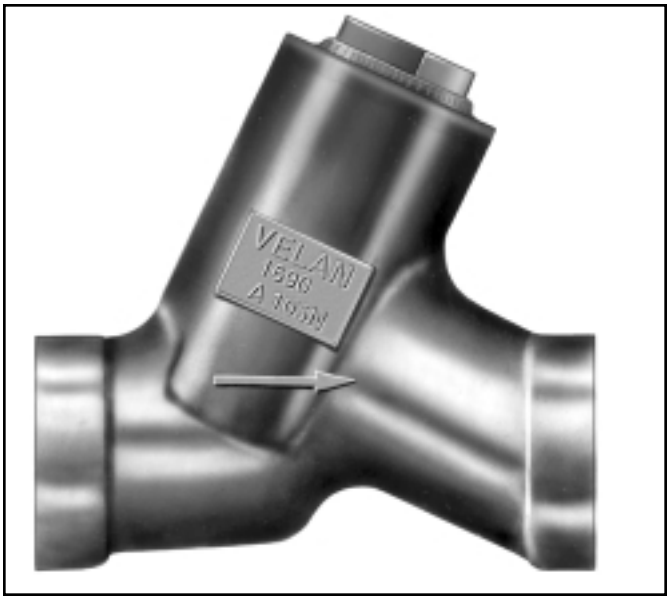


Please note this is a condensed catalog.
For a complete version, contact Velan directly.

FORGED STEEL INCLINED PISTON CHECK VALVES FOR HORIZONTAL AND VERTICAL LINES, ½–4" (15–100 mm)

THREADED, SOCKET WELD OR BUTT WELD
ASME CLASSES 1690, 2680, 4500





DESIGN FEATURES

- Solid Stellite 6 disc, fully guided for fast and full seating, even without spring.
- High Cv.
- Self-draining waterways.

CLASS	1690	2680	4500
Figure No.	8036W	9036W	5036W

DIMENSIONS, WEIGHTS AND CV

Size in mm	Port Opening		End to End		Center to Top		Socket Weld Bore	Socket Depth
	1690 & 2680	4500	1690 & 2680	4500	1690 & 2680	4500		1690 & 2680
1/2 15	0.559 14.2	0.375 9.5	4.88 124	5.75 146	3.44 87	4.75 121	0.855 21.7	0.375 9.5
3/4 20	0.559 14.2	0.559 14.2	4.88 124	7.00 178	3.44 87	5.25 133	1.065 27.1	0.500 12.7
1 25	0.833 21.2	0.559 14.2	5.75 146	7.00 178	4.69 119	5.25 133	1.330 33.8	0.500 12.7
1 1/4 32	1.125 28.6	0.833 21.2	7.25 184	10.13 257	5.63 143	6.88 175	1.675 42.5	0.500 12.7
1 1/2 40	1.125 28.6	1.125 28.6	7.25 184	10.13 257	5.63 143	6.88 175	1.915 48.6	0.500 12.7
2 50	1.688 42.9	1.125 28.6	10.13 257	12.00 305	6.94 176	8.44 214	2.406 61.1	0.625 15.9
2 1/2(2) 65	1.688 42.9	1.50 38.1	12.00 305	12.00 305	8.44 214	8.44 214	2.906 73.8	0.625 15.9
3(2) 80	1.688 42.9	1.50 38.1	12.00 305	12.00 305	8.44 214	8.44 214	3.535 89.8	0.625 15.9
4 100	1.688 42.9	1.50 38.1	12.00 305	12.00 305	8.44 214	8.44 214	(3)	(3)

(1) Consult Velan for spring materials if continuous operating temperature is above 800°F (427°C).
(2) For Classes 1690 & 2680, dimensions are as shown, or same as for 2" (50 mm) valve, depending on end connection.
(3) 4" (100 mm) butt weld or flanged connection only.

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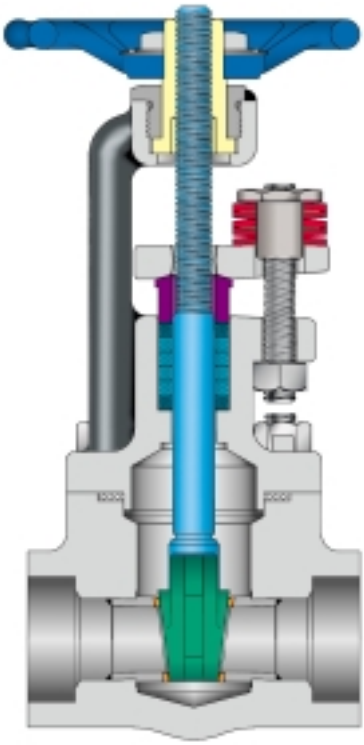
For a complete version, contact Velan directly.

VELAN

CRITICAL SERVICE
LIVE LOADED GATE & GLOBE VALVES

FORGED CARBON, ALLOY AND STAINLESS STEEL
ASME CLASSES 150–1500

FOR NUCLEAR POWER PLANTS AND OTHER CRITICAL SERVICE



GATE

DESIGN FEATURES

- Sturdy bonnet arms.
- Suitable for electric actuation.
- More repacking space.

GATE VALVES

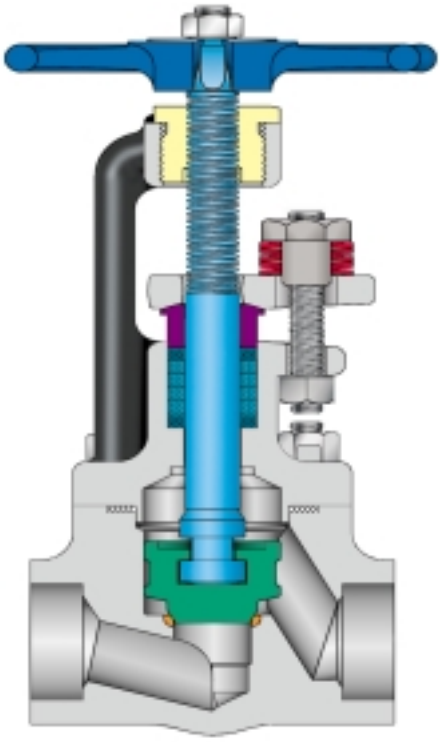
- Seal welded seats.
- Stellite 6 or cobalt free wedge and seats.

GLOBE VALVES

- Stellite 6 or cobalt free seats and discs.
- Stop, Stop-Check, Needle, Flow Control
- Y-Pattern models for ASME Classes 1500 & 2500

OPTIONS

- Double packing with leak-off.
- Live-loading.
- Packing blowout fitting.

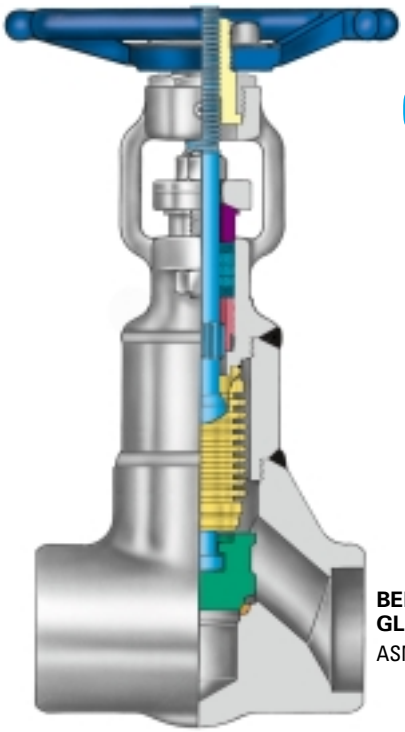


GLOBE

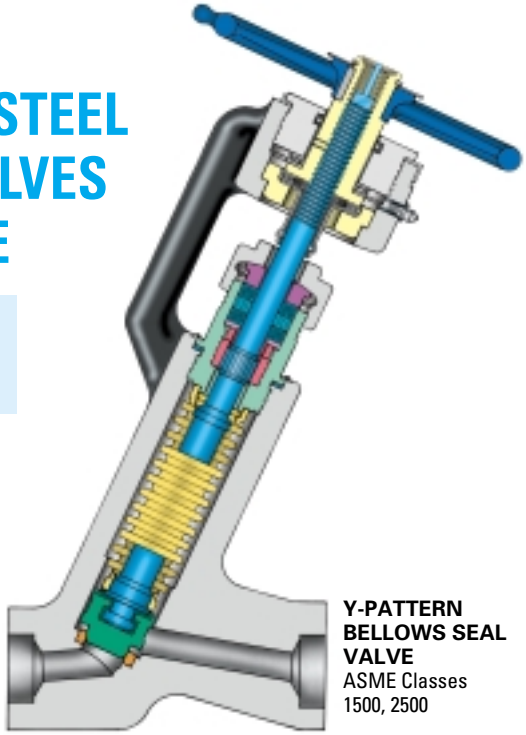
Please note this is a condensed catalog. For a complete version, contact Velan directly.

COMPACT FORGED STEEL BELLOWS SEAL VALVES ZERO LEAKAGE

NOTE: *For more information consult special bellows seal valve catalogue VEL-BS.*



BELLOWS SEAL GLOBE VALVE
ASME Classes 150–600



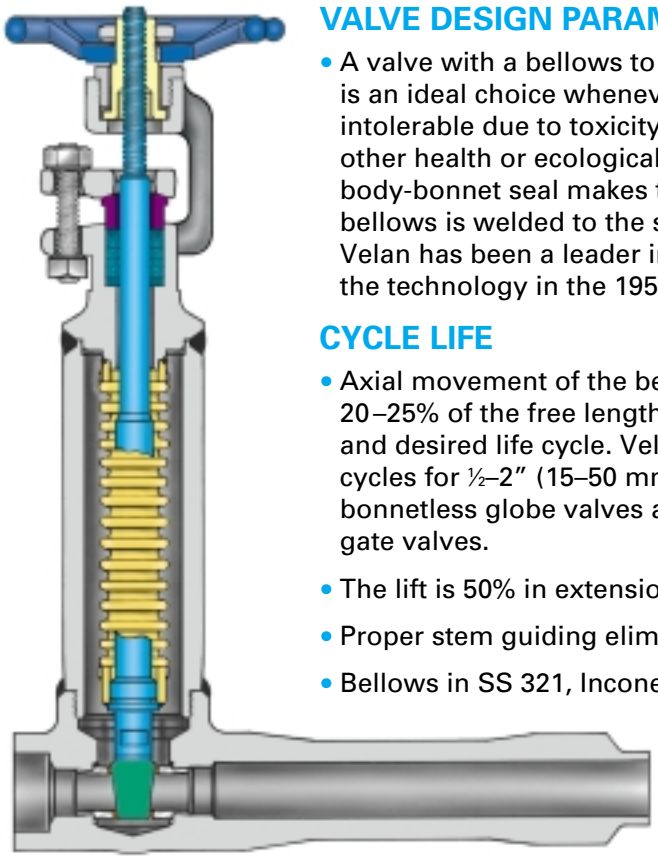
Y-PATTERN BELLOWS SEAL VALVE
ASME Classes 1500, 2500

VALVE DESIGN PARAMETERS

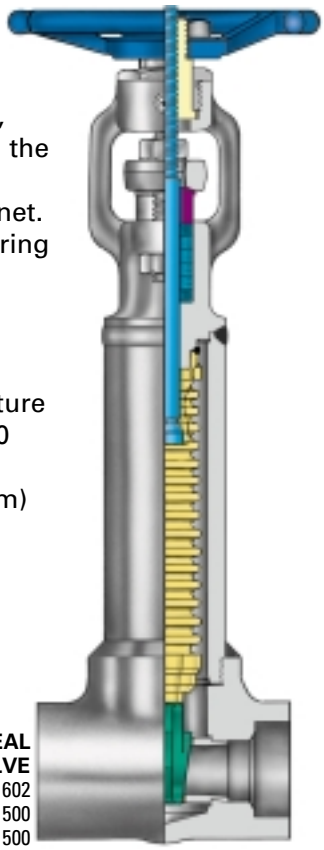
- A valve with a bellows to seal off the stem enclosure is an ideal choice whenever leakage to the atmosphere is intolerable due to toxicity, chemical corrosion, radioactivity, other health or ecological reasons. In addition, seal welding the body-bonnet seal makes the valve hermetically sealed. The bellows is welded to the stem and to the bottom of the bonnet. Velan has been a leader in bellows seal valves since pioneering the technology in the 1950s.

CYCLE LIFE

- Axial movement of the bellows is limited to a maximum of 20–25% of the free length, depending on pressure-temperature and desired life cycle. Velan bellows are designed for 10,000 cycles for ½–2" (15–50 mm) globe valves, 5000 cycles for bonnetless globe valves and 3000 cycles for ½–2" (15–50 mm) gate valves.
- The lift is 50% in extension and 50% in compression.
- Proper stem guiding eliminates torsion of bellows.
- Bellows in SS 321, Inconel or Hastelloy.



BELLOWS SEAL DRAIN VALVE
API 602
Classes 800–1500



BELLOWS SEAL GATE VALVE
API 602
Classes 800–1500
Flanged ASME Classes 150–1500

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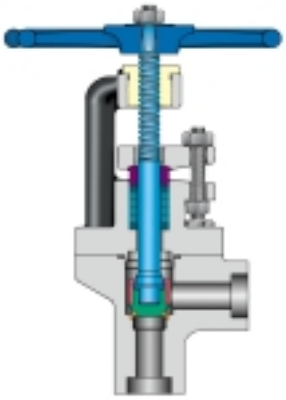
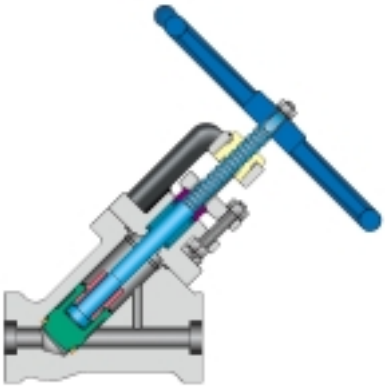
BOILER PLANT SERVICE VALVES, ½–2" (15–50 mm)

(SEE PAGE 10 FOR Y-PATTERN GLOBE VALVES)



ANGLE



45° INCLINED BOLTED BONNET

FIGURE NUMBERS

CLASS	ANGLE	45° INCLINDED
600	2215B	2216B
1500	3215B	3216B

APPLICATIONS

- Power and utility boilers
- Cogeneration systems
- Chemical recovery boilers
- Wood-fired boilers
- Solid waste fuel-firing systems
- Circulating fluidized bed (CFB) boilers
- Industrial waste recovery and incineration plants

TYPICAL SERVICE

- Blowoff
- Acid cleaning
- Steam sampling
- Water/steam shutoff
- Gauge shutoff
- Main stop drains
- Chemical feed
- Vents
- Feedwater

Many installations use a tandem combination of two valves. The valve closer to the boiler should be wide open first and then the second valve opened slowly. At the end of the blowoff period, a reverse procedure should be used.

DESIGN FEATURES

These special blowoff valves are available in bolted bonnet angle and streamlined flow 45° inclined designs for Class 600 and 1500 primary service and in bonnetless angle and inclined designs for Class 2500.

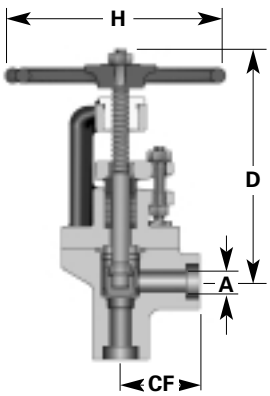
- Stellite 6 seats and fully-guided Stellite 6 discs resist the excessive corrosion and erosion effects aggravated by grid and boiler scale particles and high temperature changes.

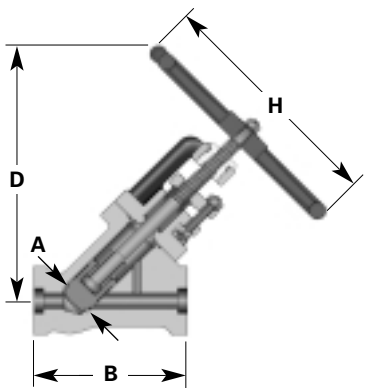
ANGLE VALVE DIMENSIONS

Size in mm	A Port	CF Center to End Weld End		CF Center to Face Flanged		D Center to Top Open		H Handwheel Diameter	
	600 & 1500	600	1500	600	1500	600	1500	600	1500
½ 15	0.453 11.5	2.00 51	2.00 51	3.25 83	4.25 108	7.48 190	7.48 190	6.00 152	6.00 152
¾ 20	0.625 15.9	2.50 64	2.50 64	3.75 95	4.50 114	7.48 190	7.48 190	6.00 152	6.00 152
1 25	1 25.4	3.00 76	3.00 76	4.25 108	5.00 127	9.50 241	9.50 241	8.00 203	8.00 203
1¼ 32	1.448 36.8	3.50 89	3.50 89	4.50 114	5.50 140	10.56 268	10.56 268	12.00 305	12.00 305
1½ 40	1.448 36.8	3.50 89	3.50 89	4.75 121	6.00 152	10.56 268	10.56 268	12.00 305	12.00 305
2 50	1.750 44.5	4.50 114	4.50 114	5.75 146	7.25 184	11.06 281	11.06 281	12.00 305	12.00 305

45° INCLINED VALVE DIMENSIONS

Size in mm	A Port	B End to End Weld End		B Face to Face Flanged		D Center to Top Open		H Handwheel Diameter	
	600 & 1500	600	1500	600	1500	600	1500	600	1500
1 25	1.50 38.1	8.00 203	8.00 203	12.00 305	12.00 305	15.20 386	15.20 386	12.00 305	12.00 305
1½ 40	1.50 38.1	8.00 203	8.00 203	12.00 305	12.00 305	15.20 386	15.20 386	12.00 305	12.00 305
2 50	1.50 38.1	8.00 203	8.00 203	12.00 305	14.50 368	15.20 386	15.20 386	12.00 305	12.00 305





Please note this is a condensed catalog. For a complete version, contact Velan directly.

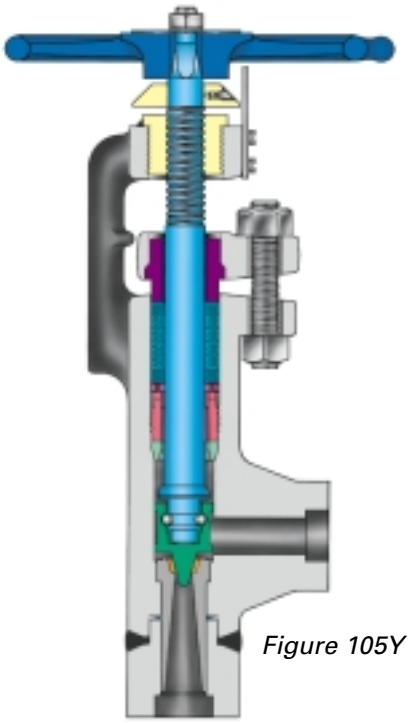


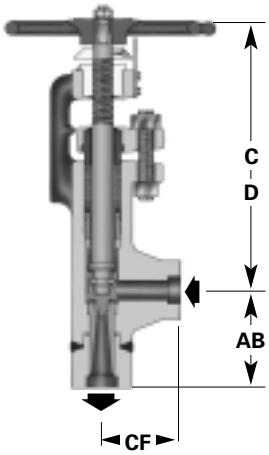
Figure 105Y

CLASS 600, 1500 & 2500 FORGED ANGLE, CONTINUOUS BLOWDOWN VALVES

This valve is designed for continuous blow-down but can also be used for sampling and boiler feed pump bypass relief where high pressure drop causes erosion and cavitation which can destroy conventional globe valves. It incorporates a hardfaced Stellite 6 disc and seat and a venturi diffuser from stainless steel type 316. Orifice range: ⅛ to 1⅛" (3.18 to 28.58 mm), depending on the capacity required.

Size in mm	AB Center to Bottom SW	AB Center to Bottom NPT	CF Center to End	C Center to Top Closed	D Center to Top Open
1/2 15	2.25 57	– –	3.19 81	11.9 302	12.6 320
3/4 20	3.12 79	3.62 92	3.19 81	11.9 302	12.6 320
1 25	3.92 100	4.42 112	3.19 81	11.9 302	12.6 320
1 1/2 40	4.95 126		3.00 76	15.6 396	16.5 419
2 50	6.50 165		5.00 127	17.1 434	18.50 470

NOTE: *Contact Velan Engineering Department for other details.*



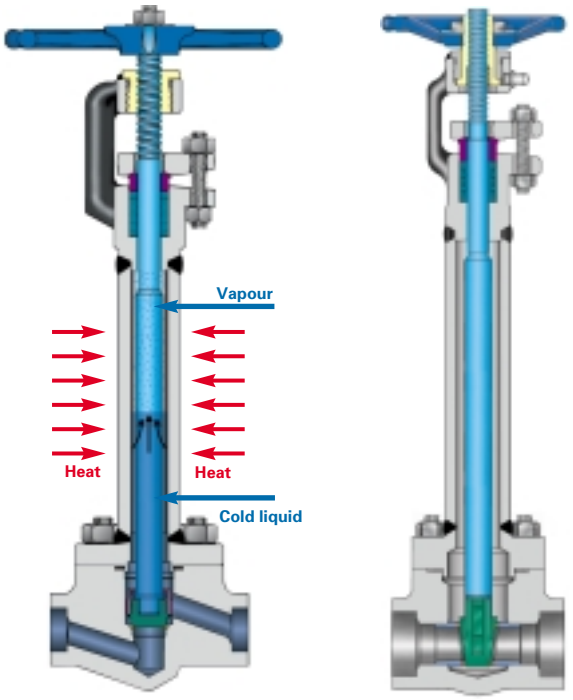
OTHER FORGED VALVES FOR BOILERS PLANT SERVICE:

- **Gate and Globe**
  2 1/2 – 24" (65 – 600 mm)
  Bolted or Pressure Seal,
  ASME Classes 600 – 4500
- **Gate and Globe**
  1/4 – 2" (8 – 50 mm)
  Bolted and Welded Bonnet,
  ASME Classes 800 – 1500
- **Swing, Piston & Tilting Disc Check Valves**
  1/2 – 24" (15 – 600 mm)
  Bolted or Pressure Seal,
  ASME Classes 600 – 4500
- **Y-Pattern Bonnetless Globe Valves**
  1/4 – 4" (8 – 100 mm)
  ASME Classes 1690 – 4500
- **Y-Pattern Piston Check**
  1/4 – 4" (8 – 100 mm)
  ASME Classes 600 – 4500

Please note this is a condensed catalog.
For a complete version, contact Velan directly.

FORGED CRYOGENIC GATE, GLOBE AND CHECK VALVES, ½–2" (15–50 mm)

IN AUSTENITIC STAINLESS STEEL
ASME CLASSES 150–1500



With Stellite 6 faced seat and solid Stellite 6 wedge

APPLICATIONS

Velan is a world leader in valves for cryogenic applications. Velan forged cryogenic gate, globe and check valves are specially designed to handle the technical problems that arise in the production, transport and storage of liquified gases such as Oxygen, Nitrogen, Argon, Natural Gas, Hydrogen or Helium (down to -425°F/-254°C). Velan specially adapted extended bonnet forged valves offer safe and efficient service.

TABLE OF LIQUIFIED GASES

Type	Boiling Point		Liquid Density
	°C	°F	lb/ft^3
Natural gas (LNG)	-168.0	-270	26.00
Methane (CH_4)	-161.5	-258	26.20
Oxygen (0_2)	-182.9	-296	71.20
Argon (A)	-185.9	-303	87.40
Helium (He)	-268.9	-452	7.82
Carbon Dioxide (CO_2)	-78.5	-109	50.60
Air	-194.4	-318	57.87
Nitrogen (N_2)	-195.8	-320	50.45
Hydrogen (H_2)	-252.7	-423	4.43
Absolute Zero	**-273.16**	**-460**	—

NOTE: *For more information consult Velan's Cryogenic Valves catalogue VEL-CRYO.*

DESIGN FEATURES

All basic design features of Velan forged steel valves outlined in this catalog are adapted to special service conditions at cryogenic temperatures.

- **Extended bonnets** with sufficient gas column length, usually specified by customer, are supplied for all valves to keep stem packing at sufficient distance away from the cold fluid to remain functional.
- **Solid Stellite 6** wedges on ½–2" (15–50 mm) valves operate with no galling in cryogenic service.
- **Kel-F inserts (optional)** for globe, piston, and swing check discs.
- **Cleaning:** All cryogenic valves are thoroughly degreased and cleaned and pipe ends are sealed to prevent contamination.

MATERIALS

- **Body and bonnet:** Austenitic stainless steel forgings used for bodies and bonnets offer excellent impact strength, minimal heat loss and protection against corrosion.
- **Stem:** To reduce galling, stems are made from advanced Nitronic 50 (grade XM-19 A479) with high tensile even at extreme low temperatures, excellent low friction and galling-free movement at points of stem contact.
- **Wetted parts:** All Austenitic Stainless Steel and Stellite 6.
- **Yoke bushings:** Bronze.
- **Packing:** Teflon or other plastic packing protected from freezing by a column of insulating gas.
- **Seating faces:** Stellite 6 is used to prevent seizing and galling. When extremely tight shutoff is required, globe and check valves may be supplied with Kel-F, Teflon or other soft inserts.
- **Bolting:** Strain-hardened Austenitic Stainless Steel.
- **Lubrication of yoke bushing nut (yoke nut):**
  Exxon: Nebula EPI
  Shell: Darina EPI
  Lubriplate No. 930-AA or 930-AAA

FORGED CRYOGENIC VALVE RANGE

- **All Stainless Steel 1/2 – 2" (15 – 50 mm) Gate Valves,** Classes 150-1500.
- **All Stainless Steel 1/2 – 2" (15 – 50 mm) Globe Valves(1),** Classes 150-1500.
- **All Stainless Steel 1/2 – 2" (15 – 50 mm) Check Valves(1),** Classes 150-1500.

(1) Dualseal disc and Kel-F insert are optional for globe and check valves.

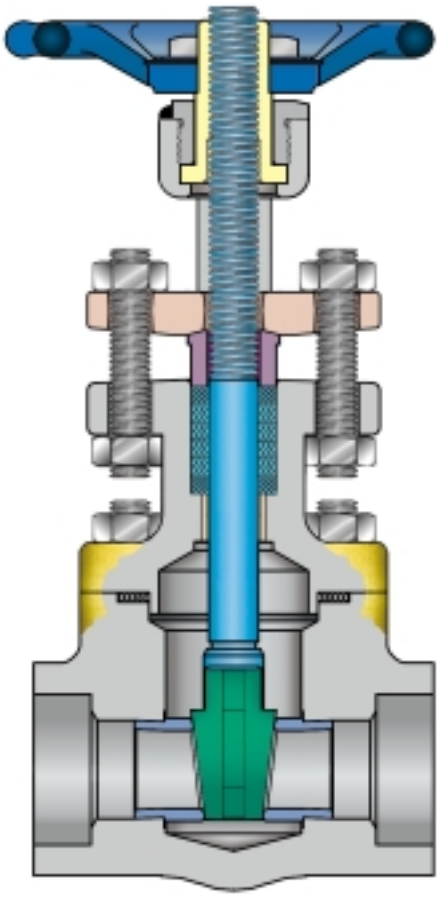
Please note this is a condensed catalog. For a complete version, contact Velan directly.

HF ACID GATE, GLOBE AND CHECK VALVES, ½–2" (15–50 mm)

ASME CLASSES 150, 800

HYDROFLUORIC ACID PROCESSING VALVES

Hydrofluoric Acid is one of the strongest and most corrosive acids. Industries using HF acid in their manufacturing process have placed an increasing emphasis on safety in using this product.



GATE VALVE

Fugitive emissions are a critical factor in the performance of any HF Acid valve and at Velan, we have been committed to reducing emissions beyond the industry standards, and providing the highest quality products to our customers for over 50 years. Velan offers a comprehensive line of Phillips and UOP approved API 602 gate, globe and check HF acid valves with several benefits.

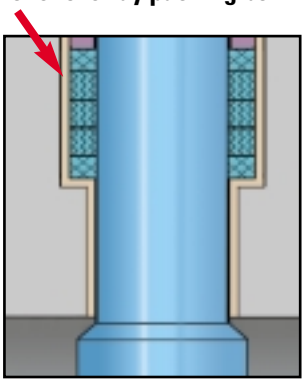
DESIGN FEATURES:

- **Stem Drive** – two-piece allows for replacement of yoke bushing in-line, removal of handwheel without affecting position of valves (closed or opened).
- **Rising Stem** – makes for easy visibility for open-close indications.
- **Gland** – two piece gland bushing/packing flange is self-aligning to prevent stem damage for cocked gland.
- **Stem made from hardened Monel K500** for strength and durability.
- **Nickel plated overlay in stem hole for carbon steel valves** to combat severe alkylation conditions.
- **HF acid detecting paint** to ensure valve sealing integrity.
- **Bonnet** – large extended type bonnet grade.
- **Bonnet Joint** – encapsulated gasket design.
- **Body** – high quality Monel or A105 normalized body with API 602 wall thickness for maximum service.
- **Wedge** solid Monel.
- **Seat rings** – made of solid Monel 400.

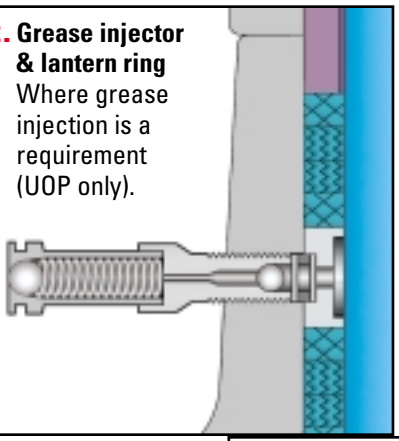
***NOTE:** For more information consult Velan's HF Acid Gate, Globe & Check Valves brochure VEL-HFA.*

OPTIONAL DESIGN FEATURES

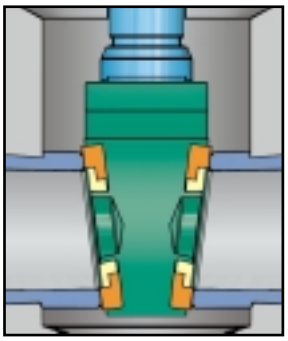
1. **Nickel overlay packing box liner**



2. **Grease injector & lantern ring**
Where grease injection is a requirement (UOP only).



3. **CTFE seat insert**
Resists abrasion and corrosion



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FABRICATED GATE, GLOBE, CHECK VALVES, ¼–2" (8–50 mm)

ASME CLASSES 150–2680

Take advantage of increased flexibility with Velan custom-design fabricated valves.

As a leading manufacturer of API 602 forged gate, globe and check valves, Velan maintains one of the largest and most comprehensive inventories available from any manufacturer. Despite tens of thousands of ready-to-ship valves located around the world, requirements inevitably come up for non-standard items, and Velan has the perfect solution: fabricated valves. Built from forged bar stock materials, Velan fabricated gate, globe and check valves offer the advantage of short lead times for non-stock items in exotic alloys.

DESIGNS:

- Gate
- Extended body gate
- Globe
- 45° Inclined globe
- Critical services
- Y-Pattern bonnetless globe
- Piston bolted cover check
- Ball type bolted cover check
- Coverless swing check

Materials

Hastelloy
F314L
Alloy 20
F347
Inconel
F9
Duplex F51
F91
F44
Incoloy
Super duplex
Many other approved materials are also available.

Connections

Flanged
NPT
Socket weld
Butt weld

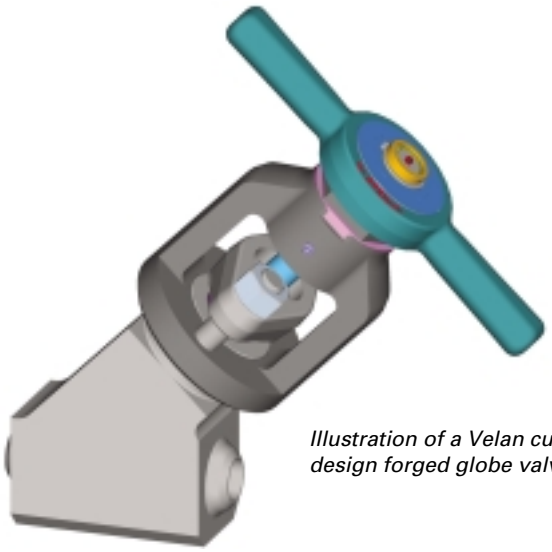

Illustration of a Velan custom design forged globe valve.

Velan can readily provide fabricated valves in a wide variety of designs. Furthermore, our Engineering Department has the expertise to custom-design a valve to best handle your critical requirements. Backed up by advanced software tools, including finite element analysis, computational fluid dynamics and 3D solid modeling, Velan has a long history of designing and manufacturing superior quality valves that outperform the most demanding performance requirements.

NOTE: *Contact Velan Sales for more information.*

Please note this is a condensed catalog. For a complete version, contact Velan directly.

HOW TO ORDER

TYPE OF CONNECTION	SIZE OF CONNECTION		PRESSURE RATING	TYPE	BODY/BONNET STYLE		BODY MATERIAL		TRIM	
A	B		C	D	E		F		G	
F	0	8	2	0	7	4	B	1	3	M	S

***Example:** is a 2" 600 Class stainless steel bolted bonnet globe valve with MS trim.*

The figure numbers shown on this key are designed to cover essential features of Velan valves.
Please use figure numbers to ensure prompt and accurate processing of your order.
A detailed description must accompany any special orders.

A TYPE OF CONNECTION

- **B** - Butt weld
- **C** - Combination (socket weld / threaded)
- **F** - Flanged B16.5 (B16.47 series A)
- **R** - Flanged ring joint
- **S** - Threaded
- **U** - Undrilled flanges
- **W** - Socket weld
- **X** - Butt weld (intermediate class)

B SIZE OF CONNECTION

Customers have the choice of specifying valve size as part of the valve figure number (**B**) using the numbers below, or indicating valve size separately.

EXAMPLES:
F**08**-2074B-13MS (valve size is part of figure number)
2"F-2074B-13MS (valve size is shown separately)

01 - ¼" (8 mm)	**04** - ¾" (20 mm)	**07** - 1½" (40 mm)	**10** - 3" (80 mm)
02 - ⅜" (10 mm)	**05** - 1" (25 mm)	**08** - 2" (50 mm)	**11** - 3½" (90 mm)
03 - ½" (15 mm)	**06** - 1¼" (32 mm)	**09** - 2½" (65 mm)	**12** - 4" (100 mm)

C PRESSURE RATING

0 - 150	**2** - 600 or 800 API 602	**3** - 1500	**5** - 4500	**7** - 900	**9** - 2680
1 - 300		**4** - 2500	**6** - 400	**8** - 1690	**X** - Special

D VALVE TYPE

01 - Flow control	**08** - Stop check	**17** - IREB gate
02 - Ball check	**09** - Needle	**18** - Extended body gate
03 - Piston check	**10** - Continuous blowdown	**21** - Boiler blowoff
05 - Conventional port gate	**11** - Swing check	**22** - Pressure relief
06 - Full port gate	**15** - Instrument	**23** - Double disc gate
07 - Stop globe		**34** - Tilting disc check

E BODY / BONNET STYLE

4 - Vertical	**A** - Special	**S** - Y-pattern bellows seal (non-rotating stem)
5 - Angle	**B** - Bolted bonnet (forged)	**T** - All welded bellows seal
6 - Inclined	**D** - Diaphragm	**W** - Welded bonnet
7 - Inclined Y-pattern screwed yoke	**E** - Extended bonnet (cryogenic)	**Y** - Bonnetless (rotating stem)
8 - Elbow down	**R** - Forged bolted bellows seal	**Z** - Bonnetless (non-rotating stem)

F BODY MATERIAL

02 - A105, WCB	**12** - F304L, CF3	**20** - Inconel(‡)	**27** - LF3/LC3
04 - F5, C5	**13** - F316(‡‡), CF8M	**21** - Hastelloy C(‡)	**31** - LCC
05 - F11, WC6	**14** - F316L, CF3M	**22** - Titanium Gr.5	**32** - F51
06 - F22, WC9	**15** - F347, CF8C	**23** - Alloy 20	**34** - F91, C12A
09 - F9, C12	**16** - F304H	**24** - LF1	**35** - F44, 254 5MO
10 - F316H/F316(‡‡)	**18** - F321	**25** - LCB	**36** - F321H
11 - F304, CF8	**19** - Monel M35	**26** - LF2	**37** - Incoloy(‡)

(‡) Must specify grade.

(‡‡) Material code "10" F316H/F316 has a minimum carbon content of 0.04 and is to be used if temperatures are over 1000°F (538°C).

Material code "13" forged F316, is not suitable for temperatures above 1000°F (538°C) as it is dual certified (F316/F316L)

G TRIM

CODE		WEDGE/DISC SURFACE(1)	SEAT SURFACE(1)	STEM	API Number	*If applicable* BELLOWS(2)
AS		Stellite 6(3)	Stellite 6(3)	321		321
CS		Alloy 20	Stellite 6(3)	Alloy 20		
HC		Hastelloy C	Stellite 6(3)	Hastelloy C		Hastelloy C
HM		HF-Acid Trim	HF-Acid Trim	HF-Acid Trim		
MC		CF8M or 316 w/ CTFE insert(4)	Stellite 6(3)	316		
MS		Stellite 6(3)	Stellite 6(3)	316/316L		321
MY		CF8M or 316	Stellite 6(3)	316	12	321
PA		NOREM	NOREM	630		IN 625
TS		Stellite 6(3)	Stellite 6(3)	13 CR (410)(5)	5	321
TY		13 CR (410 or CA15)	Stellite 6(3)	13 CR (410)	8	321
XX		Monel	Monel	Monel	9	
XY		Monel	Stellite 6(3)	Monel	11	
NA	NACE SERVICE(6)	13 CR (410 or CA15) HRC 22 max	Stellite 6(3)	13 CR (410) HRC 22 max.	8(6)	
NB	NACE SERVICE(6)	CF8M	Stellite 6(3)	316	12(6)	321
NC	NACE SERVICE(6)	Monel	Stellite 6(3)	Monel	11(6)	Hastelloy C
NE	NACE SERVICE(6)	Stellite 6(3)	Stellite 6(3)	13 CR (410) HRC 22 max.	5(6)	
NF	NACE SERVICE(6)	Stellite 6(3)	Stellite 6(3)	Same as Body		

Consult Velan's website at **www.velan.com** for a complete list of available trim materials.

(1) Base material is either the same as the body or solid trim at manufacturer's option.

(2) Bellows material shown as standard, Inconel can be used in lieu of 321 and Hastelloy C in lieu of Inconel, where design and/or pressure class applicable.

(3) Stellite 6 or Stellite 21 based on material or application at manufacturer's option.

(4) Inserts may be in seat or wedge at manufacturer's option.

(5) 616HT Manufacturer's Std. (F91 and C12A only).

(6) NACE service valves are supplied with all materials conforming to NACE MR0175. (Including bolting with max. hardness of RC22).

For installation instructions see Service Manual.

For diagnostic troubleshooting visit the Velan website at **www.velan.com**.

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